

## WE CLAIM

1. A composition comprising one or more enzymes non-covalently bound to a peptide backbone, wherein at least one of said enzymes is heterologous to said peptide backbone and said peptide backbone is capable of having bound thereto a plurality of enzymes.

2. The composition according to claim 1, comprising at least two enzymes non-covalently bound to said peptide backbone.

3. The composition according to claim 1, wherein said one or more enzyme comprises protease, cellulase, lipase, peroxidase, xylanase, oxidase, esterase, oxidoreductase, laccase, lactase, lyase, polygalacturonase,  $\beta$ -galactosidase, glucose isomerase,  $\beta$ -glucoamylase,  $\alpha$ -amylase, NADH reductase or 2,5DKG reductase.

4. The composition according to claim 1, wherein said peptide backbone comprises scaffoldin derived from a microorganism which produces a cellulosomal or amylosomal complex.

5. The composition according to claim 4, wherein said scaffoldin is derived from *Clostridium sp.* and comprises at least one internal repeating element and at least one cellulose binding domain.

6. The composition according to claim 1, wherein said enzyme is non-covalently bound to said peptide backbone by means of a dockerin region of said enzyme.

7. The composition according to claim 6 wherein said dockerin region comprises a dockerin derived from *Clostridium sp.* or a derivative thereof capable of non-covalently binding to said peptide backbone.

8. The composition according to claim 6 wherein said dockerin comprises an amino acid sequence according to the sequence of CelS or CelD as shown in Figure 1.

9. The composition according to claim 5, wherein said scaffoldin comprises CipA, CipB or CbpA.

5 10. The composition according to claim 9, wherein said scaffoldin comprises an amino acid sequence described in Figure 6.

11. The composition according to claim 5, wherein said scaffoldin comprises a plurality of internal repeating elements.

10 12. The composition according to claim 11, wherein said heterologous enzyme further comprises a dockerin region capable of binding with said scaffoldin protein.

13. The composition according to claim 12, wherein said dockerin region forms a non-covalent bond with said internal repeating units.

15 14. A composition comprising a scaffoldin protein bound to a heterologous enzyme.

20 15. A composition comprising an array of enzymes bound to a peptide backbone, wherein said composition is produced by a process comprising:

(a) expressing DNA encoding said peptide backbone in a microorganism having been transformed with DNA encoding said peptide backbone;

(b) expressing DNA encoding said enzyme in a microorganism having been transformed with DNA encoding said enzyme; and

25 (c) binding said expressed peptide backbone to said expressed enzyme, wherein said enzyme is heterologous to said peptide backbone.

30 16. A composition comprising an enzyme bound to a peptide backbone, wherein said composition is produced by a process comprising combining said peptide backbone with said enzymatic activity under conditions suitable to allow a non-covalent bond to form between said peptide backbone and said enzymatic activity, wherein said enzymatic activity is retained subsequent to said combination.

35 17. A method for producing a composition comprising an array of enzymes bound to a peptide backbone, said method comprising:

(a) expressing DNA encoding said peptide backbone in a microorganism having been transformed with DNA encoding said peptide backbone;

(b) expressing DNA encoding said enzyme in a microorganism having been transformed with DNA encoding said enzyme; and

5 (c) binding said expressed peptide backbone to said expressed enzyme, wherein said enzyme is heterologous to said peptide backbone.

18. The method according to claim 17, comprising at least two enzymes non-covalently bound to said peptide backbone.

10 19. The method according to claim 17, wherein said one or more enzyme comprises protease, cellulase, lipase, peroxidase, xylanase, oxidase, oxidoreductase, laccase, lactase, lyase, polygalacturonase,  $\beta$ -galactosidase, glucose isomerase,  $\beta$ -glucoamylase,  $\alpha$ -amylase, NADH reductase or 2,5DKG  
15 reductase.

20. The method according to claim 17, wherein said peptide backbone comprises scaffoldin derived from a microorganism which produces a cellulosomal or amylosomal complex.

20 21. The method according to claim 20, wherein said scaffoldin is derived from *Clostridium sp.* and comprises at least one internal repeating element and at least one cellulose binding domain.

25 22. The method according to claim 17, wherein said enzyme is non-covalently bound to said peptide backbone by means of a dockerin region of said enzyme.

23. The method according to claim 22 wherein said dockerin region comprises a dockerin derived from *Clostridium sp.* or a derivative thereof capable of non-  
30 covalently binding to said peptide backbone.

24. The method according to claim 22 wherein said dockerin comprises an amino acid sequence according to the sequence of CelS or CelD as shown in Figure 1.

25. The method according to claim 21, wherein said scaffoldin comprises CipA, CipB or CbpA.

26. The method according to claim 25, wherein said scaffoldin comprises an amino acid sequence described in Figure 6.

27. The method according to claim 20, wherein said scaffoldin comprises a plurality of internal repeating elements.

28. The method according to claim 27, wherein said heterologous enzyme further comprises a dockerin region capable of binding with said scaffoldin protein.

29. The method according to claim 28, wherein said dockerin region forms a non-covalent bond with said internal repeating units.